Appl. No. 09/831,025

Amdt. dated Nov. 28, 2005

Reply to Office Action of July 28, 2005

Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the

application:

Listing of Claims:

Claims 1-17. (Canceled)

18. (Currently amended) In an injection nozzle (1) for internal combustion engines, which has

at least one injection orifice (3), a nozzle needle seat (4), and a nozzle needle (5), the

improvement wherein the end of the nozzle needle (5) oriented toward the nozzle needle seat (4)

is a cone and has an annular groove (8), and wherein the width of the annular groove (8) is one-

and-a-half times greater than the diameter of the injection orifice (3) a blind hole (2) adjoins the

nozzle needle seat (4) and has the at least one injection orifice (3).

19. (Previously presented) The injection nozzle (1) according to claim 18, wherein the nozzle

needle seat (4) is the shape of a truncated cone having a base surface.

20. (Previously presented) The injection nozzle (1) according to claim 19, wherein the cone

angle of the nozzle needle seat (4) is approximately 60°.

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21. (Currently amended) The injection nozzle (1) according to claim 19, wherein the end of

the nozzle needle (5) oriented toward the nozzle needle seat (4) is a cone and that the cone angle

of the nozzle needle (5) is up to one degree greater than, preferably 15 to 30 angular minutes

greater than, the cone angle of the nozzle needle seat (4).

22. (Previously presented) The injection nozzle (1) according to claim 19, wherein the annular

groove (8) runs parallel to the base surface of the cone.

23. (Canceled)

24. (Currently amended) The injection nozzle (1) according to claim [[23]] 18, wherein when

the injection nozzle (1) is closed, the distance of the transition (7) between the blind hole (2) and

the nozzle seat (4) from the bottom (9) of the injection nozzle (1) and the distance of the annular

groove (8) from the bottom (9) of the injection nozzle (1) are essentially equal.

25. (Currently amended) The injection nozzle (1) according to claim [[23]] 18, wherein the

width of the annular groove (8) is approximately 0.1 mm to 0.3 mm, preferably approximately

0.16 mm to 0.24 mm.

26. (Currently amended) The injection nozzle (1) according to [[23]] 18, wherein the depth of

the annular groove (8) is approximately 0.02 mm to 0.2 mm, preferably approximately 0.08 mm

to 0.14 mm.

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27. (Currently amended) The injection nozzle (1) according to claim [[23]] 18, wherein the

blind hole (2) is conical.

28. (Currently amended) The injection nozzle (1) according to claim [[23]] 18, wherein the

blind hole (2) is cylindrical.

29. (Currently amended) The injection nozzle (1) according to claim [[23]] 18, wherein the

blind hole (2) is a mini-blind hole or micro-blind hole.

30. (Currently amended) The injection nozzle (1) according to claim 18, In an injection nozzle

(1) for internal combustion engines, which has at least one injection orifice (3), a nozzle needle

seat (4), and a nozzle needle (5), the improvement wherein the end of the nozzle needle (5)

oriented toward the nozzle needle seat (4) is a cone and has an annular groove (8), wherein the

nozzle needle seat (4) is the shape of a truncated cone having a base surface and wherein the

nozzle needle seat (4) has the at least one injection orifice (3).

31. (Previously presented) The injection nozzle (1) according to claim 30, wherein when the

injection nozzle (1) is closed, the distance of the piercing point (16) of the longitudinal axis of

the injection orifice(s) (3) through the nozzle needle seat (4) from the bottom (9) of the injection

nozzle (1) and the distance of the annular groove (8) from the bottom (9) of the injection nozzle

(1) are essentially equal.

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32. (Canceled)

33. (Previously presented) The injection nozzle (1) according to claim 30, wherein that the

depth of the annular groove (8) is less than the width of the annular groove (8).

34. (Previously presented) The injection nozzle (1) according to claim 30, wherein the depth

of the annular groove (8) is approximately 0.02 mm to 0.1 mm.

35. (Currently amended) The injection nozzle (1) according to claim [[21]] 30, wherein the

annular groove (8) runs parallel to the base surface of the cone.

36. (Currently amended) The injection nozzle (1) according to claim [[18]] 30, wherein a blind

hole (2) adjoins the nozzle needle seat (4) and has at least one injection orifice (3); wherein the

nozzle seat (4) is the shape of a truncated cone, and wherein the end of the nozzle needle (5)

oriented toward the nozzle needle seat (4) is a cone and that the cone angle of the nozzle needle

(5) is up to one degree greater than the cone angle of the nozzle needle seat (4).

37. (Canceled)

38. (Currently amended) The injection nozzle (1) according to [[23]] 30, wherein the depth of

the annular groove (8) is approximately 0.02 mm to 0.2 mm, wherein when the injection nozzle

(1) is closed, the distance of the transition (7) between the blind hole (2) and the nozzle seat (4)

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from the bottom (9) of the injection nozzle (1) and the distance of the annular groove (8) from

the bottom (9) of the injection nozzle (1) are essentially equal, and wherein the width of the

annular groove (8) is approximately 0.1 mm to 0.3 mm.

39. (Currently amended) The injection nozzle (1) according to claim [[23]] 18, wherein the

blind hole (2) is conical wherein when the injection nozzle (1) is closed, the distance of the

transition (7) between the blind hole (2) and the nozzle seat (4) from the bottom (9) of the

injection nozzle (1) and the distance of the annular groove (8) from the bottom (9) of the

injection nozzle (1) are essentially equal, and wherein the width of the annular groove (8) is

approximately 0.1 mm to 0.3 mm.

40. (Currently amended) The injection nozzle (1) according to claim [[23]] 18, wherein the

blind hole (2) is cylindrical, wherein the width of the annular groove (8) is approximately 0.1 mm

to 0.3 mm, and wherein the depth of the annular groove (8) is approximately 0.02 mm to 0.2 mm.

41. (Currently amended) The injection nozzle (1) according to claim [[23]] 18, wherein the

blind hole (2) is a mini-blind hole or micro-blind hole, wherein the width of the annular groove

(8) is approximately 0.1 mm to 0.3 mm, and wherein the depth of the annular groove (8) is

approximately 0.02 mm to 0.2 mm.

Claims 42-47. (Canceled)

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48. (New) The injection nozzle (1) according to claim 30, wherein the width of the annular groove (8) is one-and-a-half times greater than the diameter of the at least one injection orifice (3).